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(54) TRANSMISSION SYSTEM FOR INFORMATION ADDED TO VIDEO

(57)Abstract:

PURPOSE: To send various data such as control data together with a video signal through a cable.

CONSTITUTION: An encoder E and a decoder D are provided to a camcorder (a) and a VCR(b) or the like and various ID data such as a pickup date and time and temperature are added to an inputted video signal via the encoder E for a vertical blanking period of the signal, the result is recorded on a magnetic tape T, and when the magnetic tape T is reproduced, the decoder D is used to demodulate the ID data to serve the data at image pickup to the user. Furthermore, the decoder D is provided to a television receiver (c) or the like to demodulate the ID data added for the vertical blanking period of the video signal inputted from the VCR (b) and various control such as pattern control is automatically implemented based on the ID data.

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## CLAIMS

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[Claim(s)]

[Claim 1] Within the level image period in the predetermined location of the perpendicular blanking period of the inputted video signal Record various ID data about said inputted video signal through an encoder, and it records on a magnetic tape. The image additional information transmission system characterized by performing signal processing or the various configuration of the video signal which restored to said ID data by the decoder when playing this magnetic tape, and was outputted by that recovery output from the magnetic tape.

[Claim 2] Said ID data are an image additional information transmission system according to claim 1 characterized by being the control data of the various electronic equipment by the side of a playback monitor.

[Claim 3] Said ID data are an image additional information transmission system according to claim 1 characterized by being record data inputted from the electronic equipment which the user installed on the occasion of inclusion.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the image additional information transmission system which adds ID data to the perpendicular blanking period of a video signal.

[0002]

[Description of the Prior Art] Conventionally, it separates into a chrominance signal, a luminance signal, etc., and a video signal is recorded on a magnetic tape by a camcorder, VCR, etc. which are a recording device, and is outputted to tubular surfaces, such as a television receiver and a monitoring device, as an image by reproducing this record signal. Moreover, there is also a thing he is trying to transmit the date, time of day, etc. with a video signal as ID data for displaying on a screen as information which accompanies such a video signal.

[0003]

[Problem(s) to be Solved by the Invention] However, in order to transmit these ID data to external media, the interconnection cable for ID data transmission etc. needed to perform. Moreover, when memorizing to a magnetic tape with image information, it was able to record on another area of a magnetic tape as a

sub-code, but even when there was no means to transmit the ID data, for example, it dubbed between magnetic tapes, the ID data was not able to be transmitted.

[0004]

[A means to solve invention] This invention was made in order to solve such a trouble, it prepares a V.BLK signal addition encoder and/or a V.BLK signal decoder in a visual equipment, codes and adds various ID data to the V.BLK section of a video signal, and is made as [ transmit / said various ID data / with a video signal / with a magnetic tape / record / ].

[0005]

[Function] Various ID data can be transmitted now for control data and record data of a device which play the data relevant to the image made to record on a magnetic tape, and its magnetic tape by the cable with a video signal.

[0006]

[Example] The outline of the image additional information transmission system of this invention is explained first. Drawing 1 (a) - (d) is drawing having shown the outline at the time of forming the signal addition encoder E (only henceforth an encoder), and the signal detection decoder D (only henceforth a decoder) in a camcorder, VCR, a television receiver, etc. Drawing 1 (a) can show the outline at the time of forming Encoder E to a camcorder, and can do video tape T record of

ID data, such as atmospheric temperature when a user takes a photograph in this case (for example, time), with a video signal at a perpendicular blanking period.

[0007] Drawing 1 (b) is drawing having shown the outline at the time of forming Encoder E and Decoder D in VCR. In this case, ID data can be added to the perpendicular blanking period of a video signal with Encoder E at the time of an image transcription, it can record on a video tape T, and ID data added by Decoder D at the perpendicular blanking period can be extracted at the time of playback, various control is performed and information offer to a user etc. can be performed.

[0008] And ID data added to the perpendicular blanking period of the video signal inputted into a television receiver from VCR explained by drawing 1 (b) by forming Decoder D can be extracted, and screen control, such as screen formats, such as aspect conversion, a letter box, and letter box size, and a panning information, can be automatically performed based on the ID data as shown in drawing 1 (c).

[0009] Moreover, it is also possible to input into air-conditioning equipment, a lighting device, etc. ID data extracted by Decoder D, and to perform various control as shown in drawing 1 (d).

[0010] The example of the system using the image additional information

transmission system of this invention is explained below. In case drawing 2 (a) takes a photograph with the camcorder of television camera one apparatus, it is drawing having shown the example which adds ID data to a perpendicular blanking period. The pressure sensor with which 1 observes a camera block and 2 observes water pressure etc. in this drawing, the global positioning system (GPS) with which 3 measures the path LAT and altitude, and 4 show a weather sensor, 5 shows meteorological observation equipment, atmospheric temperature, humidity, an atmospheric pressure, the weather, rainfall, snow accumulation, etc. are observed, and a meteorological data is supplied.

[0011] 6 shows the keyboard which performs a data input etc. and these supply data, such as a photography ground, path LAT, altitude, and depth, to a camcorder from the exterior. C shows the timer built in and supplies the date at the time of photography, and the data of time of day. And said each supplied data is added to a perpendicular blanking period by Encoder E, and is recorded on a video tape T with a video signal.

[0012] In this case, since each data when taking a photograph with a camcorder is recorded on an image and coincidence, the situation at that time can be checked at the time of playback, for example, it can use effective in observation of a living thing etc., observation of the weather and a celestial body, etc. Moreover, when photoing a child's growth record, data, such as age at the time



of photography, height, and weight, can also be recorded on a video tape T with an image with a keyboard 6.

[0013] Drawing 2 (b) is drawing having shown an example in the case of forming Encoder E in VCR and using it for it in medical institutions, such as a hospital. The same sign as drawing 2 (a) considers as the same part among drawing, 7 shows medical view \*\*\*\*\* and X shows an X-ray camera. For example, inspection data, such as the patient's temperature, a pulse, breathing, and blood pressure, are recordable on a video tape T at coincidence with medical supervisory equipment 7, photoing the patient with the X-ray camera X in a certain inspection.

[0014] Drawing 3 is drawing having shown the example which records a program name, a channel name, etc. on a perpendicular blanking period using VCR. The tuner with which 8 chooses a broadcasting electric-wave in this drawing, and 9 show a teletext decoder, and M shows the microcomputer for control.

[0015] When performing retrieval of the case where the contents of an image transcription of a video tape T are managed, or its contents, reference and retrieval of the title of a program, a broadcasting station name, etc. can be performed during playback of a video tape T at any time by adding and memorizing data, such as a title of a program, a program name, a channel name, a broadcasting station name, and a broadcast date, to an image and

coincidence through Encoder E at the perpendicular blanking period.

[0016] Drawing 4 is drawing having shown the example which records receiving situations, such as field strength, antenna level, a C/N ratio, and a ghost, on a perpendicular blanking period using VCR. The tuner with which 8 chooses a broadcasting electric-wave as well as drawing 3 in this drawing, and 10 show field strength meter, and 11 shows the amount detector of ghosts.

[0017] In case a program is recorded on videotape, when reproducing the program by adding the data of a receiving situation to a perpendicular blanking period through Encoder E and turbulence of an image etc. arises, it can distinguish [ whether whose video tape T was bad, whether whose receiving situation was bad, and ].

[0018] Moreover, although ridden and transmitted to a broadcasting electric-wave, if the control signal for ghost cancellation remains as it is, the frequency band of VCR cannot record it narrowly. Then, by coding and recording the tap multiplier of a ghost removal filter etc. on a perpendicular blanking period through Encoder E, the tap multiplier etc. can perform cancellation processing of a ghost at the time of playback.

[0019] Drawing 5 (a) is drawing having shown the example which records index information, such as a location, a tape residue, and a time code, on a video tape. Microcomputer M adds the index information on a video tape T (a location, a

tape residue, time code, etc.) through Encoder E at a perpendicular blanking period at the time of an image transcription, it records on a video tape T, Decoder D extracts the index information at the time of playback, and it is made to perform control for said microcomputer M to perform retrieval search.

[0020] (Moreover, the scene of the arbitration of the image currently recorded on the video tape as shown in drawing 5 (b), for example, V1 -V6, It compresses as it is and is the image data VR of one sheet. By recording forming on a perpendicular blanking period, retrieval of the whole video tape which made the record image the index can be performed.)

[0021] Next, according to drawing 6 (a) - (f), record of ID of the property (S signal, composite signal) of a record signal is explained. It is Y1 and Y2 in these drawings. The luminance-signal processing section, C1, and C2 The chrominance-signal processing section and S show a Y/C separation circuit, and F shows YX filter.

[0022] Although it divides into a Y signal and C signal and is processed, when the input of the video signal is a composite signal, after a video signal performs separation of a luminance signal and a chrominance signal in the Y/C separation circuit S as shown in drawing 6 (a), it is processed and recorded in the luminance-signal processing section Y1 and the chrominance-signal processing section C1. However, since a beat may occur if the chroma signal component

remains in the luminance signal, the YX filter F band-limited the luminance signal, and the chroma signal component had been removed as shown in drawing 6 (b) at the time of playback.

[0023] Since a luminance signal and a chroma signal are separated and inputted when the input of a video signal is an S input as shown in drawing 6 (c) and (d) on the other hand, a chroma signal component does not need to remain to a luminance signal, and it is not necessary to form said YX filter F at the time of playback.

[0024] Then, while changing SW1 and SW2 by control of Microcomputer M at the time of record as shown in drawing 6 (e), the information of S signal or a composite signal is added with Encoder E, Decoder D extracts additional information and SW3 is changed as shown in drawing 6 (f) at the time of playback, and it is made to make the YX filter F, as for the case of S signal input, pass.

[0025] Next, record of the field, a frame, sequence information, and the topology at the time of a subsample is explained. Drawing 7 is drawing having shown the subsample pattern of a MUSE (Multipul Sub-nyquist sampling Encoding) method. When distinguishing the 1st field / the 2nd field of a video signal from the wave-like difference for example, in an equalizing pulse part, it is difficult to avoid the misjudgment exception in a non-standard signal like gear change playback.

Then, the distinction becomes easy by adding the field information on a video signal to the perpendicular blanking period.

[0026] When compressing a transmission band by the subsample like MUSE as shown in drawing 7 , it is carrying out by changing a sample phase for each [ from the 1st field to the 4th field ] field of every as illustrated. In this case, according to this topology, it can re-sample easily by adding the topology of each field to a perpendicular blanking period at the time of playback or a recovery.

[0027] Next, the case where the virtual reality effectiveness information is recorded by drawing 8 is explained. The console into which a master tape and I input a slave tape into, and, as for C, H inputs the virtual reality effectiveness information in this drawing, and E show an encoder. In addition, the virtual reality effectiveness is the effectiveness for a wind, a wind speed, acceleration, temperature and humidity, an inclination, lighting, etc. simulating a viewer's environment, and obtaining presence.

[0028] An air-conditioner is controlled according to scenes, such as a movie while viewing and listening to the temperature of the room in which a viewer is present, for example, temperature is lowered on a snowy scene, and presence increases by raising atmospheric temperature on the scene of Hawaii, and applying acceleration with the image of a roller coaster. Since such virtual reality effectiveness is linked to the image, it is necessary to memorize the control data

on a video tape synchronizing with an image.

[0029] You record such information on the magnetic tape recorder etc., and needed to make it VCR interlocked with conventionally. However, in the phase which manufactures the slave tape I from a master tape H, Decoder D extracts said virtual reality effectiveness information from Console C at the time of playback by adding the virtual reality effectiveness information to a perpendicular blanking period through Encoder E as illustrated, and the image of Projector P and the ganged operation of peripheral devices, such as Air-conditioner A, the lighting device L, each blower fan Fu, and Centrifuge G, become easy.

[0030] Moreover, in connection with the virtual reality effectiveness information, voice with the presence according to the scene of an image can be enjoyed by recording speech information, such as surround, three to 1 method, and a multi-sound, on coincidence.

[0031] Next, drawing 9 explains record of a gear change playback flag. The image processing circuit and D by which the video tape of VCR and E are prepared in an encoder, and 12 is prepared for T in the television receiver in this drawing show a decoder.

[0032] It may be better to switch the property of deflecting system and an AFC system, if the video signal of gear change playback of VCR is inputted in a

television receiver. For example, it is more desirable to have shortened the time constant comparatively to time-axis fluctuation of perpendicular horizontal frequency at the time of gear change playback, and to usually lengthen at the time of playback.

[0033] Then, the status information of being playback or gear change playback can usually be added to a perpendicular blanking period with the encoder E formed in VCR, it can output to a television receiver, the status information can be extracted by the decoder D prepared in the television receiver, and the property of deflecting system and an AFC system can be switched by usually judging playback or gear change playback and controlling the image processing circuit 12.

[0034] Moreover, there are the time constant and the AFC property that time-axis fluctuation may differ and it was suitable for the various media with various media. However, in the television receiver side, it is difficult to deal with various media, and since the parameter is set as a compromise, the sense of stability of an image is spoiled.

[0035] In this case, by the television receiver side, it becomes possible to set up optimal characteristics according to that parameter by adding the parameter of the time constant and the AFC property of having been suitable for various media to a perpendicular blanking period.

[0036] Next, record of the flag which distinguishes a standard signal or a non-standard signal by drawing 10 is explained. 13 shows a two-dimensional Y/C separation circuit, and 14 shows a three-dimension Y/C separation circuit in this drawing.

[0037] In the low-pass conversion VCR, there may be no correlation in the phase of H of a luminance signal, V, and a subcarrier, and frequency relation. However, it needed to judge whether since the three-dimension Y/C separation circuit is premised on the signal with said correlation, Y/C separation may not go well and it would have said correlation. Then, conventionally, the judgment was made with the motion detector U, Switch SW was changed and Y/C separation processing was performed.

[0038] In this invention, by adding the flag which distinguishes a standard signal or a non-standard signal with the encoder E formed in VCR to a perpendicular blanking period, the flag can be extracted by Decoder D, a standard signal or a non-standard signal can be distinguished easily, Switch SW can be changed according to the distinction result, and Y/C separation processing corresponding to each signal can be performed now.

[0039] Next, record of the flag which distinguishes whether it is a rental video is explained. Drawing 11 (a) is the outline of flag record, drawing 11 (b) is VCR, and drawing 11 (c) is drawing having shown the outline in case a television



receiver detects the flag, in H, an encoder and T show 15 and, as for a master tape and I, a duplicate tape and 16 show the image processing section, as for a slave tape and E.

[0040] It was made as [ apply / a noise canceller / at the time of playback, use image quality as software a little by changing to the playback mode by which playback quality is not necessarily good in the case of a rental video, a noise is conspicuous in many cases, and a user is called for example, a rental position etc. manually, or / deeply ].

[0041] In this case, in case the slave tape I is manufactured from a master tape H as shown in drawing 11 (a), the flag for distinguishing whether it is a rental video with Encoder E at the perpendicular blanking period of a video signal is recorded. And the duplicate tape T on which said flag is recorded from the slave tape I is manufactured.

[0042] And when playing the duplicate tape T, Decoder D detects the flag of a tape as shown in drawing 11 (b) and (c), and when the flag is a rental video, picture signal circuitry 15 and 16 can change various image quality elements automatically, and can apply a noise canceller deeply.

[0043] Moreover, in order to prevent illegal dubbing in addition to this, when Decoder D detects the flag by recording the flag of the ban on dubbing, it can also control to be unable to dub.

[0044] Next, the example which records data, such as the condition of the camcorder in the case of recording on videotape by taking a photograph with a camcorder itself, i.e., shutter speed etc., and amends at the time of playback is explained. Drawing 12 (a) and (b) are drawings having shown the outline, and the comparison-operation section in which a camera block and E perform amendment processing with the data with which the decoder extracted the video tape for image transcription playback and D, and said decoder D extracted 17 for an encoder and T in c, and 18 show the image processing section.

[0045] When taking a photograph with a camcorder, each data, such as white balance data, diaphragm data, a zoom ratio, focal data (ranging data), and shutter speed, blurring information data, etc. are added to a perpendicular blanking period with Encoder E, and are recorded on the video tape T as shown in drawing 12 (a). And when reproducing, Decoder D extracts said each data, and the comparison-operation section 17 outputs amendment data to the image processing section 18, and can perform various amendments as shown in drawing 12 (b).

[0046] Next, distinction of a solid (3D) image is explained. The image to see, the location, i.e., the right eye, of the image of two sheets, and the image seen by the left eye are shifted and photoed, and a cubic effect can be acquired if each image is seen by right-and-left both eyes with exclusive glasses etc. In this case,

the liquid crystal shutter and the liquid crystal display were used for the image shifted and photoed at the time of photography at the time of playback, and a cubic effect has been acquired by displaying by performing the inter-frame hold of each field signal.

[0047] Drawing 13 (a) and (b) are drawings having usually shown the wave of the sample hold pulse of an image and a solid image. As for the sample hold pulse of each field of an image, the phase usually synchronized as shown in drawing 13 (a), but since the phase had shifted as shown in drawing 13 (b), when it was going to see by the solid image, the sample hold pulse of each field of a solid image needed to detect whether the image of the video tape was a solid image, and needed to change the sample hold pulse. Then, the discernment becomes easy by adding the flag which distinguishes whether the phase has shifted for every field to the perpendicular blanking section.

[0048] Moreover, drawing 14 is drawing having shown a part of circuit block in the case of identifying and outputting a sample hold pulse. They are 19L and 19R in this drawing. A liquid crystal display component, 20L, and 20R A liquid crystal driver hold circuit and 21 show a pulse generator, and D shows a decoder.

[0049] By adding the image seen by said right eye, and the image, i.e., the flag which distinguishes the 1st field / the 2nd field, seen by the left eye to the perpendicular blanking section, at the time of playback, Decoder D extracts the

flag from a video signal, and the 1st field / the 2nd field is distinguished. And the distinction result is followed and a pulse generator 21 is each liquid crystal driver hold-circuit 20L on either side and 20R. A sample hold pulse is outputted to the wave-like timing shown in drawing 13 (b), and they are liquid crystal display component 19L and 19R. A solid image can be obtained now by making it drive.

[0050] Next, the example which adds a code, a security code, etc. to a perpendicular blanking period is explained. Drawing 15 is drawing having shown the outline, and D holds enquiry of a personal identification number, a keyword, etc. which a decoder and 22 show the image processing section, and M shows a microcomputer, and are inputted from the personal identification number input unit 24 etc. 23 performs mute of an image etc., when a mute circuit is shown and said personal identification number, keyword, etc. do not collate.

[0051] Recently, software not to show children, such as violence and an adult, exists plentifully. In this case, it is desirable to add ID codes, such as a code and a security code, to a perpendicular blanking period, and to record on a tape, in order that only a specific user may prevent from seeing.

[0052] So, in the usual playback actuation, such software is given so that an image may not be outputted by the mute circuit 23, when reproducing, Decoder D extracts said ID code, and it refers for a personal identification number, a keyword, etc. which were inputted by the ID code and personal identification

number input unit 24 with Microcomputer M. And it enables it to output an image only when the personal identification number, keyword, etc. collate with said ID code. Moreover, when neither a personal identification number nor a keyword collates, as mentioned above, mute of the image may be carried out, and you may make it output a message to a blue screen.

[0053] Drawing 16 is what showed the outline of V-ID data applicable to this invention, and is a wave form chart at the time of inserting additional information as 20-bit data using the 20th line of a perpendicular blanking period, and the 283rd line. In 25, a Horizontal Synchronizing signal and 26 show a color burst signal, 27 shows a reference signal in this drawing, and 20-bit additional information is allotted after said reference signal 27. In addition, it is desirable by adding CRCC (Cyclic Redundancy Check code) to this data that it is made to distinguish signals other than an ID code and an ID code.

[0054]

[Effect of the Invention] As explained above, since the image additional information transmission system of this invention can add various data or information to a part of perpendicular blanking period, i.e., video signal, and can record it on a magnetic tape, various control etc. automates and its operability improves. Furthermore, the various effectiveness of it being able to transmit by one video-signal cable, and being able to transmit said each data to other

magnetic tapes by dubbing a video signal using two or more VCR can be done so.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the schematic diagram of the image addition transmission system of this invention.

[Drawing 2] It is the explanatory view of data logging at the time of an image transcription at the time of photography.

[Drawing 3] It is the explanatory view of record of image transcription program data.

[Drawing 4] It is the explanatory view of receiving situation data logging.

[Drawing 5] It is the explanatory view of index information record of a video tape.

[Drawing 6] It is the explanatory view of property (S signal, composite signal) information record of a record signal.

[Drawing 7] It is the explanatory view of record of the topology at the time of a subsample.

[Drawing 8] It is the explanatory view of the virtual reality effectiveness

information record.

[Drawing 9] It is the explanatory view of judgment flag record of gear change playback of VCR.

[Drawing 10] It is the explanatory view of judgment flag record of a standard signal / non-standard signal.

[Drawing 11] It is the explanatory view of rental video information record.

[Drawing 12] It is the explanatory view of record of the condition data of the video camera at the time of photography.

[Drawing 13] It is the wave form chart of a sample hold pulse.

[Drawing 14] It is drawing having shown a part of circuit block for obtaining a solid (3D) image.

[Drawing 15] It is the explanatory view of special ID information record.

[Drawing 16] It is drawing having shown an example of the wave form chart at the time of inserting additional information.

[Description of Notations]

E Data encoder

D Data decoder